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### Opening Doors to Science, Technology, Engineering and Mathematics for Students of Color

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# Opening Doors to Science, Technology, Engineering and Mathematics for Students of Color

## Abstract

*This presentation will focus on special pre-collegiate outreach programs designed to provide gateway experiences for females and students of color into careers requiring advanced mathematics and science preparation. These target populations have historically been under presented in careers required advance coursework in these areas.*

Janis E. Murphy

Associate Professor, Education, Murray State University, Murray, KY

Brenda Vincent Cross

Director of Development, College of Sciences and Arts, Michigan Tech, Houghton, MI

The United States is actively engaged in an economic battle to meet the challenges of productivity and international competitiveness of a global labor market, demanding increased technological, scientific and mathematical skills. At a time when jobs require higher levels of scientific and mathematical literacy, American economic progress may be threatened with a shortage of technical brainpower. (progressive Policy Institute, 2002). This, in part, is the outcome of the failure to maximize the potential of minority students and females, who often fail to enroll in advanced science and mathematics courses. This self-selection out of higher-level courses acts as a 'critical filter' limiting college majors, post-secondary career options and college admission (Sells, 1973; American Association of University Women, 1998,2003).

In order to compete in the global economy American colleges and universities must increase the numbers of students enrolled in academic programs in science technology, engineering and mathematics (STEM). One strategy that has been used to achieve this goal is the development of initiatives that have encouraged groups of students who traditionally have not enrolled in STEM academic programs and courses to alter their enrollment patterns. The lack of persons of colors, especially females of color, majoring in the academic areas involving advanced courses in STEM has been well documented. Of (National Science Foundation, 2000; American Association of University Women, 2003)The goal of *opening doors* to, (STEM) is to provide meaningful pre-collegiate interventions which will utilize the untapped potential of females and students of color by providing gateway experiences into careers requiring advanced science and mathematics preparation.

The purpose of this presentation is to provide an overview of some successful STEM "door opening "programs which focus primarily on middle and/or high school females. There are a plethora of studies that document the importance of a solid STEM foundation for girls (Campbell, P.B. & Hoey, L., 1998). Moreover the American Association of University Women (1998) has identified female adolescence as the stage when science/mathematics enthusiasm declines at a significantly higher rate than their male counterparts. Therefore, the female adolescent years would be the most advantageous period to initiate opportunities to increase the visibility and attractiveness of careers requiring advanced science and mathematics. (American Association of

University Women, 2000; Camp, 2002).

Some of the successful University, K -12 school and/or community programs to be discussed in this presentation will be the following:

.Sisters-In-Science: Intergenerational Partnerships in Science, Engineering and Mathematics Education, Temple University (Pennsylvania)

.Smith Summer Science and Engineering Program, Smith College (Massachusetts)

.Adventures in Mathematics and Science, Murray State University (Kentucky)

.Women in Engineering Workshop(WIE)Michigan Technological University (Michigan)

.Students Integrating Mathematics Science and Technology, Illinois State University and Bradley University (Illinois) and

.Rural and Urban Images: Voices of Girls in Science, Mathematics and Technology Appalachia, Educational Laboratory (West Virginia)

All of the aforementioned University community partnerships have opened doors to STEM for students and have much strength! One shared strength is that all partners were involved in the planning to address the "whole child's" environment including parents/caregivers, community, teachers pre-service and/or practicing.

## **Presenters**

**Janis E. Murphy**, an Associate Professor of Education at Kentucky's Murray State University and affiliate faculty member for the Multicultural, Class and Gender Studies minor, is a multifaceted educator with over 30 years experience in teaching/mentoring diverse students. She has a Ph.D. in Educational Administration from the University of Minnesota, a Masters in Elementary Education from George Washington University, and has completed a Child Development Internship for Exceptional Children with Communication and Interaction Disorders under the direction of the Minneapolis Children's Medical Center.

Dr. Murphy possesses an assiduous desire to make a contribution to build an educational system which maximizes the talents of all participants Therefore she is actively involved in college living/learning experiences and often facilitates student involvement in community service projects, and encourages discussions/preparation related to science, technology, engineering, mathematics (STEM) and other academic interest topics.

**Brenda Vincent Cross** has been Director of Development for the College of Sciences and Arts at Michigan Tech since May 1999. In this position she is responsible for fundraising for 10 College of Sciences and Arts academic departments, the two ROTC programs, the Dean of the College of

Sciences and Arts, and the Rozsa Center for the Performing Arts.

Prior to joining Michigan Tech Brenda was the Dean of Students and Director of Student Support Services at Suomi College (now Finlandia University). Her first position at Suomi was as Interim Counselor in the Student Support Services Trio Program in the fall of 1994. She joined Suomi as a full time Career Counselor Fall 1995. A year later she was promoted to Director of Student Support Services.

Brenda's bachelor's degree is in Modern Languages (French), her Master's is in Guidance and Counseling. Her Ph.D., from the Union Institute and University is in Multicultural Education and Counseling.

She has taught French and English at the high school level, Career Life Planning, Design in Business, and the Deans Seminar at Suomi College, and Psychology at Michigan Tech.

She and her husband, Dr. James S. Cross, are parents of two sons, Beniquez, who lives in northern California, and John, who lives in Ohio.